

**CONSTRUCTION MANAGEMENT SYSTEM**

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**A PROJECT PROPOSAL SUBMITTED TO THE DEPARTMENT OF INFORMATION TECHNOLOGY IN THE SCHOOL OF COMPUTING AND INFORMATICS IN PARTIAL FULLFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF BACHELOR OF SCIENCE INFORMATION TECHNOLOGY, MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the study

The construction sector plays an important role in economy worldwide. In almost all countries of the world, the construction sector is always used to invigorate the national economies (Mogbo,2001). The products from this industry include but not limited to housing, water supply, transportation, communication, power supply, manufacturing, waste disposals and the acquirement of these facilities defines the economic growth of a country.

We all are aware of errors and losses of funds and man-power arising from non-continuity and poor tracking of projects. This is primarily caused by the deficiency associated with manual storage and processing of project information. Therefore, this computer base project tracking information system of home owners, apartments and commercial buildings projects will be able to track building construction from the start of development stage to completion stage keeping the record of every detail of the projects and information secured as it ensures adequate information security, time saving, easy storage and retrieval mechanism.

The developments of computerized systems are expanding over the past years and most of these systems are increasingly substituting the manual system.

When home owner wants to build a house or apartments he/she has to make a lot of calls and get connected by his/her friends, to find the appropriate contractors which is not a good thing because they might connect you to one who hasn’t done something similar to what you might want making your project to fail due to lack of a system that can help you get what you need.

## 1.2 Problem Statement

The current system we have for managing workers and tracking progress of construction is still characterized by manual and inefficient processes despite the technological innovations and developments. This renders a great challenge of getting engineers, electrician, plumbers, architects and painters who are qualified to do a great job.

Below are the issues that arise during construction of individual homes and apartments hence challenging coordination and tracking of the construction progress.

A lot of paper work is involved in keeping track and recording of workers and their salaries which might be damaged leading to conflict between workers, engineers and home owners due to poor management.

Time is wasted looking for qualified engineers, architects who can build a standard building.

Monitoring and inability to know what stage the building is and the amount of money it has used and time taken to construct.

The above problems can be solved by using our system.

## 1.3 Research Objectives

### 1.3.0 Main Objective

The main objective is to develop a system that can connect future home owners and construction workers, improve the management of construction development from start to end, help monitoring and keep track of the progress.

### 1.3.1 Specific Objectives

1. To come up with a computerized system as a solution to assist in connecting future home owners and contractors.
2. To develop a system that can help in management of building construction and monitor workers involvement in site construction.
3. To develop a system that can keep track on the progress throughout the construction period.

## 1.4 Research Questions

1. How will the computerized system as a solution to assist in connecting future home owners and contractors?
2. How will the developed system help in management of building construction and monitor workers in construction site?
3. How will the developed system keep track on the progress of construction throughout the period?

## 1.5 Significance of the Study

This system is designed to assist building owners in monitoring and tracking the progress of construction, through this the system is able to work in stage where you cannot request for engineer if there is no architectural drawings of the house you need you must complete one stage to go to the next stage of construction.

Building owners benefit from the system in that, all the application materials are stored in the system thus making it easier to track down and know if someone is qualified and has skills through showing the latest work he/she has done and completed in due time.

Building owners has real-time follow up of the construction thus making it easier to know what is being done in the construction site. This cuts the cost of visiting the site in daily basis to whether the work was completed.

A notification module will be used to notify building owners and workers when certain changes are required, progress and completion of different stages of the building.

## 1.6 Scope of the study

To create a system for everybody to help them in search of engineers, architects, plumbers and electrician that will ease the process involved in project tracking and progress monitoring.

# CHAPTER TWO: LITERATURE REVIEW

## 2.0 Overview

This chapter provides an understanding to the concept of construction management and the importance of putting a lot of effort in the earlier stages of a construction project. It focuses on subjects that are available in literature and related to the construction management.

Every construction project must have the owner known as client. This is the project partner who has initiated the project or who have thought the need of the project, organized the project funding and who has been convinced that it is a worthwhile investment. In most of cases, the clients are the sponsors of the whole construction process and provide the most important perspective on project performance.

## 2.1 Functions of existing construction management system

Worldwide, the construction industry is the largest industry contributing to the growth of the economy of countries (Elbeltagi, 2009). Although the contribution of the construction industry to the national economies, it considerably varies amongst various economies with geographical locations.

This industry accounts 6% of global GDP and it serves almost other industries (World Economic Forum, 2016, p. 9). This general contribution is large enough to justify its rigorous impact to the achievement of the national socio-economic development settings by providing shelter, employment, infrastructure and other aspects of poverty reduction. In UK, construction contributed 8% to the UK’s Gross Domestic Product (CIOB, 2010). Generally, various studies revealed that construction industry accounts for between 6%

and 10% of GDP. For example, Chitkara (2004) asserts that the construction industry accounts from 6% to 9%. Other researchers assert that the maximum contribution of the construction industry is 10% of the GDP in many countries (Bhimarayan, 2001). According to (Lowe, 2003) the contribution of this industry ranges from 7% to 10% in the developed countries and from 3% 6% for developing countries.

## 2.2 Components of existing construction management system

### 2.2.1 Construction Projects

A construction project as any other project can be defined as a temporary achievement which has a beginning and an end. It means that a project cannot go on indefinitely timelines and must have a defined purpose.

Every construction project must have the owner known as client. In other words, client implies one person or one organization to whom all other parties are to consult. Every Construction project is unique as it is one-off products designed to satisfy the needs of a specific client at a particular time. It is entirely down to objectives and needs. It is therefore understandable that the client’s knowledge in construction project is a paramount key of a project success as he will need to make informed decisions to ensure best value for money.

### 2.2.2 Construction Project Team

The construction is a dynamic process, requiring members of the project team to work together to continually fine-tune and adjust the detailed project requirements, designs and construction methods, sequence, resources and logistics (ACIF, 2010). The project team must comprise People from different disciplines or specialization for the sake of team performance.

### 2.2.3 Construction Contracts

A construction project is a complex net of contracts and other legal obligations, each of which must be carefully considered. In its simplest form, a contract may be an oral agreement by the parties and for most projects it is in written form whereby printed standard forms are used as the basis of the contract so that all parties may have a clear picture of their rights and obligations (Maarouf, 2011, p. 7). Accordingly, a construction contract is a kind of formal and legally binding agreement that must be observed during the project implementation.

## 2.3 Characteristics/Features of existing construction management system

Every construction Project is unique and it is characterized:-

### 2.3.1 Scope

It’s normally detailed in the bills of Quantities determining the project budget.

### 2.3.2 Schedule

which is the agreed period to execute the project.

### 2.3.3 Responsibility

Engineers and clients are responsible for any delay or failure that may occur during the project.

### 2.3.4 Quality

The quality of the materials and workmanship leads to standard buildings.

## 2.4 Types of existing construction management system

### 2.4.1 Manual system

Most people use manual and older methods of searching for engineers and architects, through this method they tend to find unqualified engineers. Keeping track and monitoring the client must be visiting the site often to see the progress and changes made, this method wastes a lot of time and resources.

### 2.4.2 BIM 360

BIM 360 is an online project management system designed for construction industry. It is designed to help project, field and BIM managers to speed up the delivery of their projects and manage their project budget and adhering to industry standards, safety rules and project specifications. BIM 360 enables teams to effectively design, implement workable schedules, enhance communications and resolve issues faster. It allows managers to have near absolute control over their projects, resulting faster and more efficiently delivery of their projects. BIM 360 features include; construction tracking, real time data, manage field data, track key performance indicators, dashboards, quality assurance.

### 2.4.3 Jonas Premier

Jonas Premier is a remarkably powerful, beautiful and simple to use cloud construction software for construction companies under the Jonas construction software. It is a simple, modern and powerful software which will automate your entire workflow and discover an easier way to get more profitable jobs. Premier has been designed for all groups of people i.e. General Contractor/Design Build, Construction Management, Land Developer, Home Builder, Civil, Fit-Out or Specialty Contractor All this is provided in one accounting, job cost, project/document/drawing management solution specifically designed to meet the needs of your business. Cloud technology creates a better world for construction - automation, collaboration.

## 2.5 Challenges of existing construction management system

### 2.5.1 Poor Communication

Communication is an important tool in any profession, but it’s especially important when work is delegated amongst various parties. Without clear and effective communicating, important tasks can slip through the cracks and the team can remain unaware of an issue until it’s too late to rectify

### 2.5.2 Limited Skills

Construction is very much a reputation-based industry. People tend to work with people they know and trust. This can often be a great thing, as teams who know how to work together can be incredibly efficient. But when there is a skills gap in the team, it could cause some delays.

### 2.5.3 Unrealistic Expectations/Bad Forecasting

Some clients and stakeholders may make some big asks. Whether they want a project completed on an accelerated schedule or on a limited budget, there may be some challenges that come with their expectations.

### 2.5.4 Time management

A lot of stakeholders perceive time constraints as among the biggest issues that result in defective designs, high rates of accidents, and loss in revenue. Scheduling conflicts and missed deadlines can lead to contractors inadvertently cutting corners in order to catch up. This can further snowball into more delays and higher costs as they try to find and fix defects or risk contractual penalties.

### 2.5.5 Unrealistic expectations

Impossible deadlines and unreasonable requests are some of the biggest morale and productivity killers in a project. Sometimes, the client, the consultants, and the board have unrealistic expectations of a project and want to put their ideas into action immediately. This stems from the competitiveness of the industry, driving stakeholders to set unachievable rather than logical business requirements.

## 2.6 Summary

The literature reviews suggest that technology and advanced management tools strengthened the functions of the project office. More organizations are adopting and applying project management practices, tools and techniques to its various operations. Therefore, a permanent project supporting entity that provides comprehensive project management knowledge is needed. Advanced Internet and computer technology is assisting organizations support the needs of project management. Eventually, the project office will function as a heart of project management community.

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